Purchase Specification

For

Gas Turbine Generator Cooling Air Filter House / Plenum Assembly

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1.0 Introduction

1.1 This specification establishes the requirements for the design, manufacture, and delivery of a Cooling Air Filter House / Plenum Assembly to be installed in a cooling air intake system for a Gas Turbine Test Site at the Naval Surface Warfare Center, Carderock Division, Ship Systems Engineering Station (NSWCCD-SSES), Philadelphia, PA.

1.2 The Cooling Air Filter House / Plenum shall be fabricated, assembled, and shipped in as complete a unit as possible.

1.3 The Cooling Air Filter described in this specification must be designed to be structurally and thermally adequate to withstand the lifting and handling, load conditions and operating conditions described in this specification.

1.4 The Cooling Air Filter House / Plenum Assembly is to be delivered to NSWCCD-SSES no later than 12 weeks after Date of Contract.

2.0 Scope

2.1 Equipment and Services to be provided by the Contractor:

2.1.1 The Contractor shall be responsible for delivery of each of the following to NSWCCD-SSES in Philadelphia (installation by others). Each item is to be in accordance with the specifications provided herein:

Item	Qty	Description
0001	1	A Two Section Filter House / Plenum Assembly, Including : Bird Screens, Filter Racks, Internal Foreign Objects Barrier (FOB) Screens, Instrumentation ports, and Two Discharge Ducts (One Per Section)
0002	1 Lot	Release for Manufacture Documentation (Section 6.0)

2.1.2 The Contractor shall be responsible for the design, procurement of materials, fabrication, cleaning, surface preparation, painting, packaging and shipping of all items included in this specification. The Contractor is responsible for the product in transit.

2.1.3 The design of structural steel shall be in accordance with the specification of the American Institute of Steel Construction, latest edition, except where modified by local government regulations or Government's special requirements specified herein. Modifications for local government regulations or Government's special requirements shall be made only if they exceed the requirements of the Codes.

2.1.4 The Cooling Air Filter House / Plenum Assembly shall have hardened lift points to allow lifting and movement. These lift points shall be designed where possible to lift through the system component center of gravity. Temporary shoring shall be designed, manufactured, and provided with the Cooling Air Filter to facilitate movement including installation. Where the integral strength of a component section will not allow free standing storage, storage stands shall be designed, manufactured and provided. All design drawings and hardware shall have centers of gravity calculated and clearly marked. Where the component sections have been made symmetrical, lift points shall be made on both sides of the mirroring section feature.

2.1.5 The Contractor shall be responsible for the accuracy of its designs and full conformance to the requirements presented in this specification. Approval of any drawings, calculations and/or tests by the Government shall not relieve the Contractor from these responsibilities.

2.1.6 Nothing in this specification shall relieve the Contractor of the responsibilities for performing, in addition to the requirements of this specification, such analyses which the Contractor considers necessary to insure that the design, material, and workmanship are satisfactory for the service intended, or as may be required by common usage and/or good practice.

2.1.7 The Contractor shall maintain all hereafter-specified data and records. These will be delivered to the Government after the work has been accepted.

2.1.8 The Contractor shall establish and maintain a system for the control of quality during manufacture and examination, which will insure that all components and assemblies furnished under this specification meet requirements hereinafter specified.

2.1.9 The Contractor shall provide all necessary and incidental labor, materials, tools, equipment and services which must be employed to satisfy the requirements stated in this specification.

2.1.10 The Contractor shall provide, for review and approval, all of the data requirements described in this specification, including the complete and detail drawings for all equipment and work under this specification.

2.1.11 The Contractor shall provide the Government and his agent access at all times to all places where work is being done under this specification. They shall have full access to facilities for unrestricted inspection of such work.

2.1.12 The Contractor shall fabricate (at his facility) and ship the Cooling Air Filter House / Plenum Assembly described below to the buyer at the location specified herein. The only remaining work required by the Government to install the filter house assembly shall be:

- Install the required air filters (procured separately)
- Install the required gaskets and fasteners at each flange
- Install the pressure sensing instruments at the instrumentation connections on the filter house provided by the Contractor
- Install electrical grounding cables, as required.
- Secure the Cooling Air Filter House / Plenum Assembly to its foundation

2.2 Equipment and Services to be provided by the Government:

2.2.1 The Government will unload at the site, store and erect all items furnished by this specification.

2.2.2 The Government will provide and install pressure-sensing instruments at the instrumentation connections in the Cooling Air Filter following erection.

2.2.3 The Government will provide grounding cables, as required, following erection.

2.2.4 The Government will install the foundation for the Cooling Air Filter House / Plenum Assembly.

2.2.5 The Government will install the fasteners that secure the assembly to the foundation.

3.0 Applicable Documents

3.1 The following specifications, standards, and codes, latest edition, form a part of this specification. The design of the items identified in this specification shall be in strict compliance with all applicable sections herein.

3.2 Referenced Specifications, Standards, and Codes

3.2.1 American Welding Society (AWS), Standards D1.1 "Structural Welding Code – Steel", D9.1 "Sheet Metal Welding Code", and D10.12 "Guide for Welding Mild Steel Pipe"

3.2.2 American Institute of Steel Construction, Inc. (AISC), ASD 9th Edition

3.2.3 American Iron and Steel Institute (AISI)

3.2.4 American Society for Testing and Materials (ASTM), Standards A36, A105, A106, A123, A176, A181, A240, A325, and A563

3.2.5 American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standard 52-76

3.2.6 American National Standards Institute (ANSI), Standards B1.20.1"Pipe Threads, General Purpose (Inch)", B16.11 "Forged Fittings, Socket-Welding and Threaded", B16.5 "Steel Pipe Flanges and Flanged Fittings"

3.2.7 Steel Structures Painting Council (SSPC)

3.2.8 International Building Code, 2003

3.2.9 Department of Transportation (DOT), CFR 49

3.2.10 Occupational Safety and Health Agency (OSHA), Part 1910 "Standards Improvement (Miscellaneous Changes) For General Industry and Construction Standards"

3.2.11 Federal Specification TT-S 00230C

4.0 Technical Requirements

4.1 General

4.1.1 Site Conditions:

4.1.1.1 Location: Indoor

4.1.1.2 Outdoor Air Temperature Range: -5ºF to 105ºF

4.1.1.3 Indoor Air Temperature Range: 45°F to 105°F

4.1.1.4 Relative Humidity Range: 05% to 100% (outside air)

4.1.1.5 Altitude: Approx. 52 ft. above mean sea level

4.1.2 Design Load Conditions

4.1.2.1 Erection: Dead load plus seismic load.

4.1.2.2 Normal Operating: Dead load, plus dynamic load (live load) resulting from operating conditions specified in Section 4.1.3, plus seismic.

4.1.2.3 Allowable unit stresses shall be stipulated per Section 3.2.2, except where modified by local requirements.

4.1.3 Operating Conditions

4.1.3.1 The maximum inlet gas flow rate is 40 lbs/sec (20 lbs/sec each Section) at 100°F at 14.667 PSIA.

4.1.3.2 The filtered air, when using Pneumafil TMP 85-24 filter elements, shall meet the following quality requirements:

4.1.3.2.1 Solid material in the airstream shall not exceed 0.2 grains of solids per 1000 standard cubic feet of air.

4.1.3.2.2 Particulates greater than 10 microns in size shall not exceed 5% of the weight of all particulates in the filtered air stream.

4.2 Arrangement

4.2.1 Cooling Air Filter Housing is to be constructed with two separated sections. Each section is to have a filter bank sufficient for filtering 20 lbs/sec of air at 100°F at 14.667PSIA.

4.2.1.1 The pressure loss through the bird screen and clean filter elements shall not exceed 0.35 inches W.G.

4.2.1.2 Sufficient filter surface shall be included in the installed filter elements to provide 2000 hours of service before the pressure loss through the bird screen and dirty filter elements exceeds 2.0 inches W.G.

4.2.2 The Cooling Air Filter House must be designed to fit within the allowable area as defined in Figure 1 below.

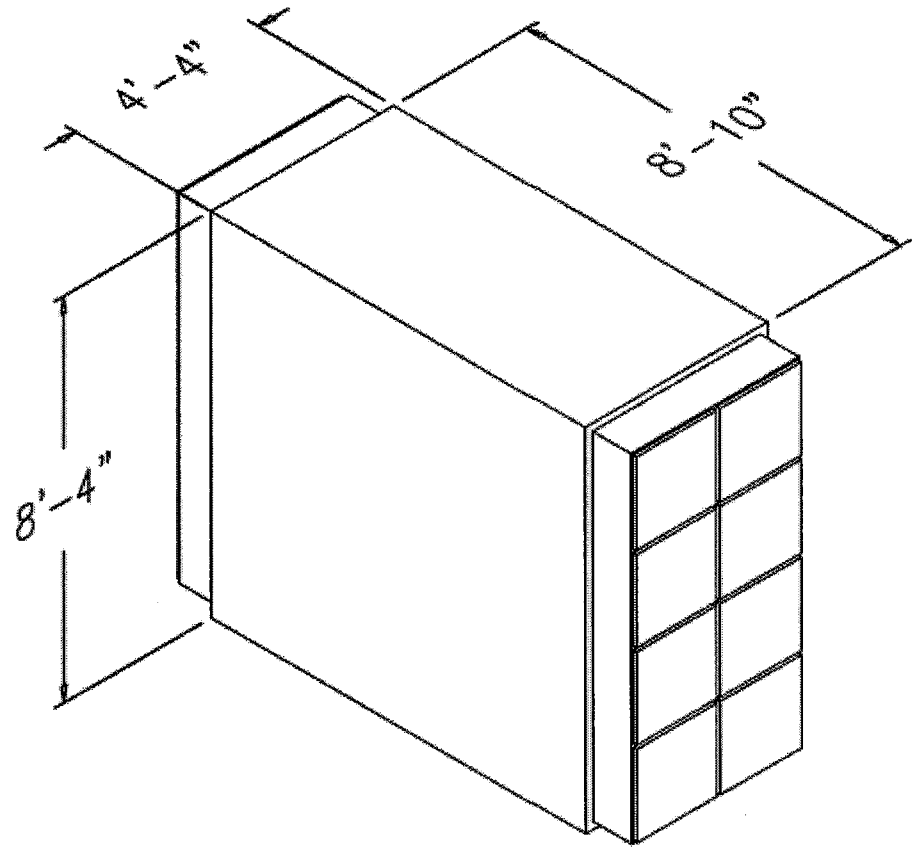

Figure 1: Cooling Air Filter House Maximum Size (Does Not Include 32" ID Discharge Ducts)

4.2.3 Each Cooling Air Filter House Section shall have an independent discharge connection located on the bottom of the plenum as shown in Figure 2.

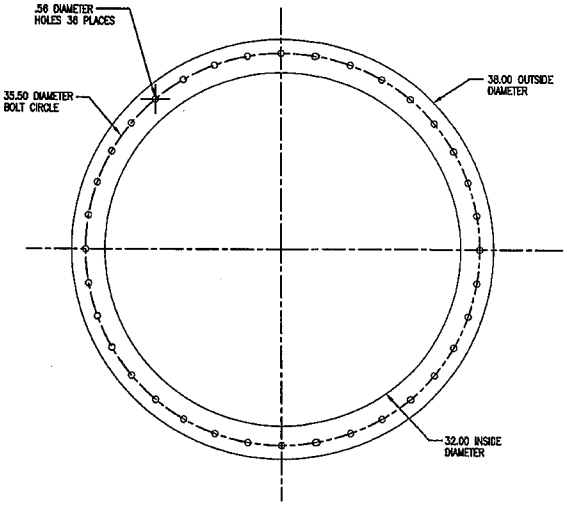

Figure 2: Cooling Air Filter House Discharge Flange Detail

4.2.4 Lift points (eyes) shall be provided to permit handling, loading, unloading, and erection.

4.2.5 The Cooling Air Filter shall have a sectionalized and detachable galvanized wire mesh screen to prevent birds, foreign objects and other particulate matter from entering or being carried over into the plenum and downstream component sections

4.2.6 The Cooling Air Filter shall have a removable FOB screen atop the entry to both 32" discharge connections. Filter Mesh is to be 1" x 1" with 1/8" diameter wire.

4.2.7 Mounting provisions are in Contractor scope, location to be provided (by Government) later.

4.2.8 The Cooling Air Filter is to use Pneumafil TMP 85-24 filter elements.

4.2.9 Two (2) pressure taps, one (1) per section, shall be provided as shown in Figure 3. Locations will be determined at design review.

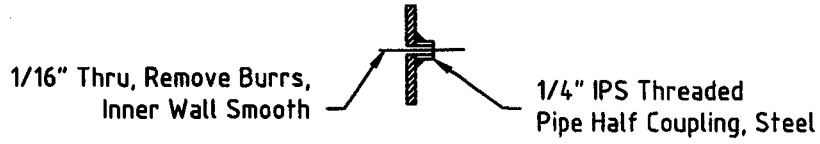

Figure 3: Pressure Sensing Connection Detail

4.3 Tolerances

4.3.1 Tolerances shall be in accordance with the following:

4.3.1.1 Flange Tolerances:

4.3.1.1.1 Flatness of flanges shall be held within a tolerance of ± 1/8 inch. Contractor shall insure that flanges will not be distorted due to the torque of bolts.

4.3.1.1.2 Flanges shall maintain parallelism or perpendicularity, as applicable, within a total tolerance of ± 1/8 inch.

4.3.1.1.3 Round Flanges shall maintain the required diameter within ± 1/8 inch.

4.3.1.1.4 Location of all holes shall be held to a true position of ± 1/16-inch diameter circle.

4.4 Materials and Processes

4.4.1 Material for filter frames, retainers and screen shall be galvanized steel per ASTM A-123. Welding shall be in accordance with AWS D1.1. All exterior welds are seal welds.

4.4.2 All external welding shall be continuous. All internal non-continuous welded joints shall be fully caulked with sealant per Federal specification TTS 00230C (3.2.11 above), or equal, before painting.

4.4.3 Material for the plenum housing shall be ASTM A-36, 3/16" thick.

4.4.4 Gasket material shall be ¼" thick, 70 shore A durometer, neoprene gaskets.

4.4.5 Surface Preparation and Painting

4.4.5.1 Carbon steel surfaces (interior and exterior) shall be cleaned in accordance with SSPC-SP6 (3.2.7 above), Commercial Blast Cleaning. Dust and blast products shall be removed from the surface of sandblasted steel by high-pressure air or vacuum cleaning.

4.4.5.2 Paint all Carbon Steel interior and exterior surfaces with one shop coat of Carbo-Zinc HS-11 (Green) paint, 3.0 to 5.0 mils dry film thickness.

4.4.5.3 Paint all Carbon Steel interiors with one finish coat 890 Epoxy Finish (Gloss Green #9351), 3.0 to 5.0 mils dry film thickness.

5.0 Technical Data

5.1 Drawings

Final, detail outline and section drawings are to be submitted and approved by the Government prior to proceeding with any fabrication work. These drawings are required to include materials, dimensions, tolerances, surface finishes (where applicable), welding details, instrument tap details, rigging features, weight and center of gravity data, flange details, bolting, and support details and loads. Review and comment of final drawings will be provided 14 days after receipt of the drawing package by the Government.

5.2 Calculations

Calculations for support reactions and the structural adequacy of the Cooling Air Filter are to be submitted and approved by the Government prior to proceeding with fabrication.

6.0 Release For Manufacture

6.1 The Government will provide a release for manufacture to the Contractor following approval of the final drawings and calculations by the Government. See paragraph 5.1 and 5.2 above.

7.0 Inspection and Testing

7.1 The Contractor shall notify the Government two weeks prior to the shipping date for the Cooling Air Filter House / Plenum Assembly. The Government reserves the right to conduct an in-plant inspection of the pieces prior to packaging for shipment.

8.0 Shipping

8.1 Packaging

8.1.1 Equipment shall be packed for shipping in a manner that will ensure acceptance and safe delivery at destination. Supplier is responsible for damage during shipment.

8.1.2 Each package shall be marked with the Contract Number, Contract Item Number and Purchase Specification Number TS050-19.

8.1.3 Shipping Address: Naval Surface Warfare Center
Carderock Division
Ship Systems Engineering Station
Receiving Code 3361, Bldg. 542
Philadelphia Naval Business Center
Philadelphia, PA 19112-1403
Attn: Mr. Howard Feinstein, Code 9112
Phone (215) 897-8895